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Writing Strategies for Fostering Reading Comprehension

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Abstract

Educational methods for developing metacognitive strategies received increased attention in the last decades, especially in the field of fostering reading comprehension. We proposed to research the possibility of stimulating the use of reader's metacognitive strategies in reading by specifically designed writing instruction. After selecting four reading strategies which improve comprehension, special writing instructions were elaborated for stimulating the use of these strategies. We have reformulated two expository texts from textbooks used in the 4th and 7th grade of elementary education in concordance to the writing tactics, and tested student's comprehension. According to results, reading comprehension improved significantly for the reformulated texts. An eight-week writing instructional program was applied in 4th grade classes. Comparing the pre- and post-test results with false-treatment and control groups indicated significant increase in using metacognitive strategies in writing. Results indicate that metacognitive strategies in writing for more comprehendible texts can be trained in elementary grades.

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Keywords: Writing instruction; reading comprehension; metacognition;

1. Introduction

Efficient, persuasive writing is fundamental for succeeding in school and after school career. In educational settings students demonstrate their knowledge predominantly through writing. More important, writing is an important tool for remembering and organizing what we learn.

According to cognitive models, writing can be defined as a problem-solving process (McCutchen, Teske, & Bankston, 2008). Skilled writers often "problematize" a writing task, using a knowledge transforming strategy, as defined by Bereiter and Scardamalia (1987).

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The sophisticated problem-solving process of writing is evidenced by think-aloud protocols of expert writers, who elaborates different content and rhetorical goals when writing. Flower and Hayes (1981) points out that writing is a goal-directed process. In the act of composing, writers create a hierarchical network of goals and these in turn guide the writing process. Hayes & Flower identified three cognitive processes in writing. When planning, the writer recalls or finds relevant information, organize it according to its goals, and sets goals for communicating with the audience. The translating process includes text-producing and in accordance with the plan. Expert writers also review the text for detecting and correcting errors. Flower and Hayes' cognitive process of writing is still considered one of the seminal pieces of research in the field of writing today.

1.1. Writing instruction

Academic writing instruction focus on expository and argumentative writing; although other writing modes, like writing narrative, descriptive and expository texts are also considered (Cromley, 2005). Explicitly teaching strategies for each stage of the writing process has a strong impact on the quality of all students' writing. Overall quality of student's writing improves when they are taught specific knowledge about how to write (i.e., test structure instruction) (Graham, McKeown, Kiuhara, & Harris, 2012).

However, the ultimate purpose of writing is reader's comprehension. Every writing instructional method should include a focus directly on what will make the text comprehensible for the reader. Writing is not a process of merely communicating information; it is a process of communicating information effectively, in a comprehensive way. The writer's primary question or main goal to accomplish, regardless of content: how can I help the reader to understand my main ideas? A shift in attention is therefore needed from "what will be the main idea of the text" or "setting rhetorical goals" toward "how can I make the reader to comprehend what I want".

Considering focusing on reader's comprehension as a primary goal, writing processes like planning, translating, reviewing and monitoring will address the question: what text characteristics will help the readers' understanding process? Revising checklists of writing tasks should also include questions like "What writing strategies did I include to foster reader's comprehension"?

In classroom settings there is on overemphasis in learning to write, rather than writing to learn or writing for reader's comprehension (Frey & Fisher, 2007). Writing and learning are regularly treated as discrete subjects (Wallace, Pearman, Hail, & Hurst, 2007). When teaching writing, students are usually instructed how to use strategies for identifying and summarizing main ideas, asking questions about texts, inferring. For example, strategies like About/Point (Morgan, Meeks, Schollaert, & Paul, 1986) helps students distinguish between main ideas and supporting details. Graphic Organizers aids students in reading comprehension by providing a tool for organizing information and making connections across the curriculum, aiding in reading comprehension (Cromley, 2005).

Reading and writing can be considered as analogous processes of composing (Fitzgerald & Shanahan, 2000; Tierney & Pearson, 1983). There are cognitive processes in writing which are reversed in reading (Ahmed, Wagner, & Lopez, 2014). In case of reading, we associate images and thoughts from our long-term memory to written signs (letters, words, sentences); associating these images and thoughts, finding causalities and temporal succession between them results text comprehension. When composing text we transcode knowledge, images and thoughts from our LTM in written signs. Theories of reading and writing processes suggest that they are interconnected, recursive processes of coding and decoding meanings in/from text messages (Bereiter & Scardamalia, 1987). Shanahan (1990) recommends teaching reading and writing in conjunction.

In order to write for reader's comprehension in mind, we have to take evidence of processes included in reading comprehension. Metacognition is the process of reflecting, monitoring and controlling one's knowledge and thoughts (Flavell, 1979). Metacognition is probably the most important process responsible for learning efficiency (Wang, Haertel, & Walberg, 1990). It contributes to learning performance independent of intellectual ability (van

der Stel & Veenman, 2010). Metacognition is often compared to self-regulation and self-regulated learning, (see (Zimmerman & Schunk, 2011 for an overview).

Metacognitive strategies in reading like forming and testing hypotheses about texts or identifying and summarizing main ideas has crucial effect on text comprehension (Baker, 1989; Block, Gambrell, & Pressley, 2002; Cromley, 2005). Reading involves metacognitive processes working for text comprehension; writing, on the other hand might be considered as applied metacognition (Hacker, Keener, & Kircher, 2009).

There are some text characteristics which facilitate the use of metacognitive strategies, making the text more comprehensible. Reading is a process of decoding individual letters and words, then a recording process, when we create larger, more meaningful chunk of information from the results of the decoding process. Therefore reading for comprehension requires splitting text into chunks. Readers figure out phrase- and clause-size information chunks for comprehension. Writing strategies like organizing information with graphical organizers and writing it accordingly will help the reader in chunking information for better comprehension. Research has shown that the nature of metacognitive judgments, that is, the criteria on which these evaluations are based, is an important factor in determining their accuracy (Dinsmore & Parkinson, 2013).

The main goal of our study is to investigate the possibility of using writing tactics aimed at stimulating reader's use of metacognitive strategies, which should result in better text comprehension.

2. Method

In order to identify writing strategies for stimulating reader's metacognition, in a first step we have selected metacognitive strategies in reading which are suitable to be stimulated by specific writing considerations.

Type of written text has a role to play in choosing appropriate strategies for reading comprehension. Narrative and expository texts are most frequent in educational settings. Strategies used for comprehending these text types might differ, which has to be taken into consideration when choosing writing strategies for fostering reader's comprehension. Since expository texts are more often used in educational settings, we have decided to identify metacognitive comprehension strategies to be stimulated by writing considerations only for these kinds of texts, in a first step.

We have identified four metacognitive reading strategies suitable to be stimulated by specific writing tactics (see table 1 for a more detailed overview).

- Before reading experienced readers motivate their activity by establishing the purpose of reading, like finding answers to interesting questions or a resolution for a problem (Almasi, 2002; Brown & Pressley, 1994; Pressley, 2000) Inexperienced readers read texts monotonously, just for finding-out what is in it. We can enhance the motivation of readers with writing tactics like formulating questions to-be answered in the text, or pointing out what situations or problems can be addressed with the information from the text.
- Experienced readers seek for connections between written information, like causalities, temporal successions, arguments for a statement, etc. This kind of thinking process can be supported by creating a semantic plan of the written information (like word webs/clusters). When putting information on paper, text should be fragmented in a way that information from a cluster to be included in one sentence or paragraph, accordingly.
- Experienced readers chunks new information into a well-rehearsed, or known label, which helps in overcoming working memory limitations and memorizing (Pressley, 2000). Adding subtitles to every subtopic will help readers to draw on this mental process.
- After reading, experienced readers check out and also deepen their comprehension by summing up the main ideas of the text (Adams, Treiman, & Pressley, 1998). By writing summaries the writer will prompt readers to recall the main ideas.

Table 1. Strategies for text comprehension, supported by specific writing tactics

What can impede comprehension	Description	Reading/writing Metacognitive strategies for overcoming	Rationale: comprehension can be fostered by...	Tactics
Reader's inert knowledge	Knowledge about the topic which is not recalled	Metamemory processes: what do I know about this domain?	Stimulating recall of previous domain-knowledge can foster comprehension	Questions with well-known answers in the topic domain Short recall of the well-known facts in the beginning of the text.
Large amount of new information in the text	Cognitive overload. Difficulty to make connection between information.	Identifying the possible connections between information. What information should we include in a specific text structure (single sentence, paragraph, chapter)	By chunking related information, and pointing out connection between them	Including connected information in a paragraph. No more than three new information in a paragraph. Writing a descriptive subtitle for every 2-5 paragraphs.
Lack of reading motivation.	Reader cannot recognize why the text can be important to him. Reader does not find the topic interesting. (She will not monitor himself for comprehension, even if reads the text)	Considerations before writing: what can be brand-new for the reader? Why should he present interest in reading? What can he do differently after reading the text?	If reader is eager to find answer to some questions he reads more willingly.	Raising reader's interest with questions in the first paragraphs to be answered later in the text. Giving special attention for pointing out the applicability of text-information.

In a pilot study we have investigated the hypothesis if expository texts from textbook are written in accordance to these tactics, level of comprehensibility increases. We have selected a text from a 4th grade textbook (support for a Geography class) and a 7th grade textbook (History) used in the national education system. The two texts were rewritten or completed according to the four tactics mentioned: introductory questions to-be-answered in the text were formulated at the beginning, information details or arguments for an assertion were presented in a single paragraph, text were divided in sub-chapters with subtitles and a resume was written after each text.

Original text was presented to 9-9 fourth and seventh grade children (control group), and rewritten text to 9-9 children from the same classes (treatment group). Children were selected from an average school with the guidance of their teacher's advices. There were no prior classroom activities with the texts selected; however, children who have self-reported to read the texts before from curiosity were excluded from the experimental groups. Texts were presented on A4 papers, and children were instructed to read them in self-paced manner, two or more times if necessary, until they have comprehended them. After reading, there was a 10 minutes discussion in a topic not related to the text (e.g. what have you been doing in the holiday?). After the break they were given a paper-and-pencil comprehension text with four questions (two knowledge questions, and two comprehension questions, according to the first two steps of Bloom's taxonomy of thinking levels (Bloom, 1956). Children from experimental group significantly outperformed control group children, indicating that the four text-writing tactics increases text comprehensibility.

We have elaborated an educational program for teaching the four writing tactics in elementary grades. Five elementary school teachers were trained during an 8-hour training program to apply the method. The 75 children from their classes formed the treatment group. The four writing tactics were taught to 4th grade children during an 8-week period, three classes a week, 20-30 min. each class. Students learned how to rewrite textbook chapters using the tactics mentioned, moving to write their own expository texts applying the four tactics.

Eight teachers from regular classes were asked to give special attention to teaching writing strategies for eight weeks, at least three times a week. Children from their classes formed the false-treatment group (N=78). A third group of four classes formed the control group (N=69). There were no instructions given to these teachers. Every children included in this design experiment were in the 4th grade (mean age 9 years and 3 months). Classes from the three experimental groups were from regular schools, from rural and urban areas in approximately equal proportion.

Pre- and post-tests were applied in all three experimental groups. Children were requested to write everything they know about two familiar topics: vehicles and animals. Tests were taken by experimenters, following similar instructions.

Responses were coded according the following criteria: texts were broken down to phrases, the presence of introductory passages and information from the same semantic or logical category (e.g. arguments or details for a case) were included in the same paragraph. Two points were given if the text met the criteria, one point if the criteria was partially met (e.g. if there was a noticeable effort from the student to respect the criteria mentioned). Texts were evaluated by one of the teachers (although for children not included in their classes) and one experimenter. If the sum of the evaluations differed considerably (more then 3 points), the evaluators clarified the reason of the difference.

3. Results

We compared mean ranks of the three groups with the Wilcoxon signed-rank test. Results of children who did not complete pre- or postest writings, or who were missing more than 5 days during the 8-week training period were excluded from data analysis. Difference between pre- and post test results were significant in the treatment group, but not in the case of the control and false-treatment groups (although in the case of the later was almost significant, see table 2).

Table 2. Intragroup comparison of pre-and posttest results (Wilcoxon test)

Group	Significance
Treatment	0.000
False-treatment	0.059
Control	0.578

We can conclude that training in using the four writing strategies was efficient.

Paired intergroup comparison of pretest results showed no significant difference between groups. Comparing posttest results showed significant difference for treatment-control and treatment-false treatment group comparisons, treatment group scoring higher in both cases. Comparing posttest results of false treatment and control groups resulted no significant difference (see table 3).

Table 3. Intergroup comparison of pre- and posttest results (Significance level resulted form Mann-Whitney test)

Groups compared	Pretest	Posttest
Treatment-Control	0.209	0.000
Treatment-False treatment	0.332	0.000
False treatment-Control	0.779	0.278

4. Discussion

Reader's comprehension strategies should be taken into account when composing texts. Comprehensibility of expository texts increases when they are written in a specific manner of stimulating reader's metacomprehension

strategies. Results suggest that when instructing well-investigated writing strategies by focusing on what influences reading comprehension, writing performance increases as indicated by the comprehensibility of written text.

Results have some limitations. Although as a part of the writing program the four writing strategies were selected with the primary goal of stimulating reader's metacognitive strategies, the goal of writing for reader's comprehension was not explicitly mentioned in the development program. However, findings suggest that when designing more complex development program should be elaborated where reading and writing strategies are instructed as different manifestation of the same cognitive processes - coding and decoding information with symbols - with deliberate focus on reader's comprehension processes.

Moreover, it would be worthwhile to investigate writing methods for fostering reader's metacognitive strategies in case of expository texts also.

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